

Revegetation Test Plots
Experimental Design
for
Brush Wellman, Inc.
Topaz Mining Property
Juab County, Utah

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Prepared By
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Introduction

Experimental revegetation test plots will be established on Brush Wellman, Inc. Topaz Mining Property in Juab County, Utah with the purpose of determining a feasible revegetation program for reclaiming disturbed areas. This test program will be a joint effort conducted by Brush Wellman, Inc. and the Division of Oil, Gas, and Mining, with all expenses being the responsibility of Brush Wellman, Inc.

The vegetation used in this experimental program will be a composition of species representative of the area and tolerant of the existing soil and climatic factors.

The areas involved in the experiment will be the three existing waste dumps; the Roadside, the Blue Chalk, and the Fluoro dumps. The dumps are overlain by tuffaceous rock which weathers rapidly to a sandy clay, with a high proportion of clay. As shown by laboratory analyses this material is highly nutrient deficient and will require the addition of nitrogen and phosphorous. Potassium will not be required.

Experimental Design

The experimental design will entail all three dump areas, involving a total of 2.07 acres, to take into account the age and degree of weathering of each dump. There will be two plots per dump to determine the affect of slope and degree of erosion control; one on a relatively flat surface and one on a sloping surface. Each plot will be 100 feet by 150 feet (approximately 0.34 acres) and will be divided equally into three subplots (approximately 0.115 acres) to accommodate a corresponding number of different fertilizer levels. See figure 1 for example of plot design and Table 1 for fertilizer application rates and locations. The type of fertilizer to be used will be the discretion of Brush Wellman, Inc.

The same seed mixture and application rates will be used on all plots. See Table 2 for seed mixture composition and application rates. A list of seed suppliers and approximate costs of the seed involved in this program is included in the appendix.

Site Preparation

The surface of each selected area will be graded, scarified, and fertilized. Seeding will be done by the broadcast and drag method. Each plot and subplot will be staked with some type of semi-permanent markers for future reference points.

Alternative Suggestions

A straw mulch at a rate of 2,000 lbs/ac may be used to assist in curbing soil erosion while vegetation is becoming established. It could be applied prior to seeding using a tractor with a disk and would involve approximately 50 to 60 bales.

Fencing of the experimental plots to protect them from grazing activities could also be employed if necessary.

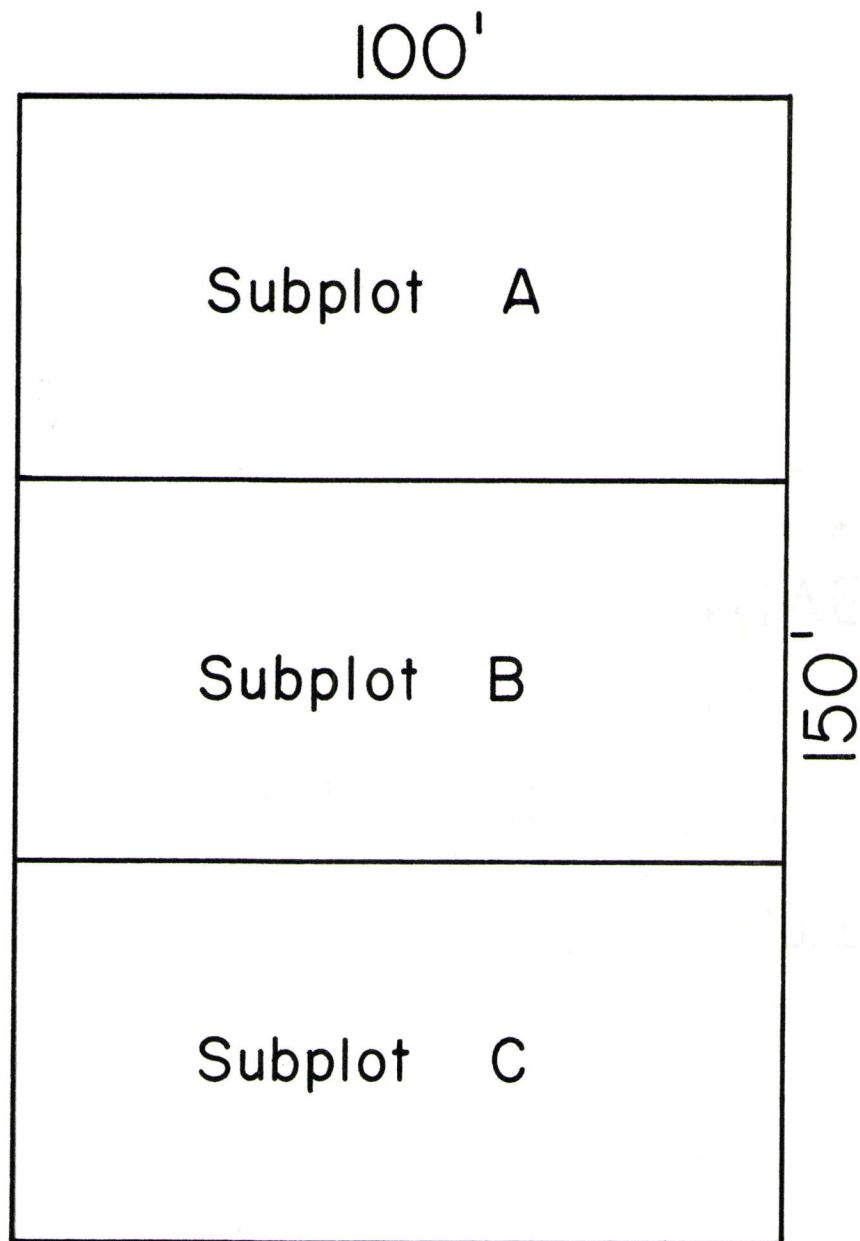


Figure 1. Plot Arrangement

<u>Location</u>	<u>Element</u>	Rate (pounds/acre)
Subplot A	Nitrogen	35
	Phosphorous	100
Subplot B	Nitrogen	55
	Phosphorous	120
Subplot C	Nitrogen	75
	Phosphorous	140
Total approximate pounds of nitrogen required		- 115
Total approximate pounds of phosphorous required		- 250

Table 1 fertilizer application rates and locations.

<u>Species</u>	<u>Application Rate</u> <u>(pounds/acre)</u>
<u>Grasses</u>	
Russian Wildrye (<i>Elymus junceus</i>)	2
Fairway Crested Wheatgrass (<i>Agropyron cristatum</i>)	2
Standard Crested Wheatgrass (<i>Agropyron cristatum</i>)	2
Indian Ricegrass (<i>Oryzopsis hymenoides</i>)	1
<u>Shrubs</u>	
Winterfat (<i>Eurotia lanata</i>)	2
Fourwing Saltbush (<i>Atriplex confertifolia</i>)	2
Cardinal Autumn Olive (<i>Elaeagnus umbellata</i>)	0.5
<u>Legumes</u>	
Yellow Sweetclover (<i>Melilotus officinalis</i>)	2
Nomad Alfalfa (<i>Medicago sativa</i>)	1
<u>Forbs</u>	
Wild' Sunflower (<i>Helianthella uniflora</i>)	<u>0.5</u>
TOTAL	15

Table 2 Seed composition and application rate.

Appendix

Approximate seed costs as quoted by Mr. Lloyd Stevens, Stevens Bros. Ephraim, Utah, December 20th, 1977.

<u>Species</u>	<u>Cost/Pound</u>
Russian Wildrye	\$12.00 - \$16.00
Indian Ricegrass	"
Fairway Crested Wheatgrass	0.75 - 1.00
Standard "	"
Winterfat	4.00
Fourwing Saltbush	2.00 - 2.25
Little Sunflower (wild)	2.00
Yellow Sweetclover	1.00 - 2.00
Nomad Alfalfa	"
Cardinal Autumn Olive *	8.00

* Quoted by Ms. Claire Gabriel, Native Plants, Salt Lake City, Utah, December 19th, 1977.

The total approximate costs for seed should be somewhere between \$90.00 and \$120.00.

WILDLAND PLANT SEED

Collectors & Producers

- 1) CLYDE ROBIN SEED COMPANY, INC.
Mr. Steven R. Atwood, Vice Pres.
P.O. Box 2091
Castro Valley, California 94546
- 2) LONGMONT SEED COMPANY
51 Brown Street
P.O. Box 923
Longmont, Colorado 80501
- 3) ARKANSAS VALLEY SEEDS, INCORPORATED
Mr. Robert C. Appleman, President
(303-254-7469)
P.O. Box 270
Rocky Ford, Colorado 81067
- 4) NORTHPLAN SEED PRODUCERS
Mr. Loring M. Jones
P.O. Box 9107
Moscow, Idaho 83843
- 5) GLOBE SEED & FEED COMPANY
Mr. L.H. Haslam
Truck Lane
Twin Falls, Idaho
- 6) ~~SHAYS~~ **SHARP** BROS. SEED COMPANY
Mr. Gail E. Sharp
(316-398-2231)
~~Kealy~~, Kansas 67850
Healy
- 7) E.C. MORAN
Stanford, Montana 59479
- 8) JACKLIN SEED COMPANY (Division of The Vaughan-Jacklin Corp.)
Mr. John Thorne, Ph.D., Research Director
(509-926-6241)
E. 8803 Sprague Avenue
Spokane, Washington 99206

UTAH

- 9) HORSELY-CUMMINGS SEED COMPANY
Mr. Dave Cummings
(801-723-5246)
P.O. Box H
Brigham City, Utah 84302
- 10) Gary Jorgenson
Ephraim, Utah 84627
- 11) John Plummer
Ephraim, Utah 84627
- 12) STEVENS ~~ENTERPRISES~~ **BROS.**
S. Lloyd Stevens
P.O. Box 496
Ephraim, Utah 84627
- 13) Roger Stewart
Ephraim, Utah 84627
- 14) Native Plants
P.O. Box 15526
Salt Lake City, Utah 84115
(801) 466-5332
Claire Gabriel
Seed Specialist